**Mathematics**

*In Mathematics at The Bourne Academy we focus on the quality of teaching and learning across all years. Maths lessons are adapted to suit student needs and provide challenge, independence, and aspirations. Our aim is to create ambitious, self-confident, students who have the resilience to cope with questions in unfamiliar contexts. We want our students to build emotional literacy through the demands of their homework and mathematical fluency to create high aspirations within school and beyond.*

**KS3**

Within the KS3 curriculum, emphasis is placed on creating opportunities for retrieval, mathematical fluency, building confidence, and mastering mathematical skills. This helps students build a strong foundation that will support them in KS4 and beyond. The curriculum is broken into several units across Y7 & 8.

These units cover

* Number – Axioms and arrays, order of operations, accuracy and estimation, prime factors, fractions
* Algebra – Expressions and equations, linear graphs
* Ratio and Proportion, fractions, decimals and percentages.
* Geometry - Angles in polygons, area and perimeter, volume and surface area.
* Statistics and Probability – Univariate and bivariate data, sets and probability

The use of Knowledge Organisers are used as part of our ‘Do Now’ retrieval practice to support retention of knowledge. Within KS3 students receive a midyear and end of year assessment, this is used to support intervention, the feedback cycle and group setting. A Question Level Analysis is provided after each assessment point which allows us to understand the strengths and weaknesses of each child and support future planning.

Homework is done through SPARX online, which is a personalised Maths programme, adapting to the strengths and weaknesses of the students. Students receive one hour of homework and times table practice each week.

**KS4**

Students are examined at the end of year 11, completing GCSE Mathematics with the exam board Edexcel Pearson. The students complete three papers, consisting of one non calculator paper and two calculator papers.

The curriculum at KS4 continues to build on the learning from KS3. The topics selected to be taught in Year 9 ensure that they have the fundamental skills to be successful within the GCSE. Students are tiered with streaming in the Higher and Foundation tier.

The topics taught include:

* Number – Indices and standard form
* Algebra – Equations and inequalities, quadratics
* Ratio and Proportion – multiplicative reasoning
* Geometry – Angles, Pythagoras, trigonometry, real life and algebraic linear graphs, transformations, similarity congruence and vectors, circle theorems
* Statistics – interpreting and representing data
* Probability - probability trees, experimental probability

During year 10 and 11 students start to build on schema with the subject exploring more complex topics, regularly reviewing work through retrieval practice.

The use of a Question Level Analysis (QLA’s) is used post assessment to support independent learning and future planning for staff. Homework is completed using Sparx online, which continues to consolidate learning and is personalised towards the student’s needs.

Assessment points take place throughout the year that are in line with school assessment calendar. These assessments help with students gaining familiarity with the exam style questions, track progress and obtain up to date gap analysis though the QLA’s, informing the feedback cycle.

**KS5**

There are two pathways for studying maths beyond GCSE as well as offering the opportunity to re-sit the subject.

Core Maths is offered to students who achieve a grade 4 or higher at GCSE. This course allows students to explore the subject with greater real-world applications. The course includes analysis of data, personal finance, estimation, critical analysis of given data and models. The AQA Mathematical Studies course allows students to explore statistical techniques, critical path analysis or graphical techniques. Topics covered are

* Analysis of data
* Maths for personal finance
* Estimation.

The course is studied over 2 years with the final assessment taken in the form of two papers with preliminary material provided by the exam board. The exam board is AQA.

Maths A level is offered for students who achieve a grade 7 or above at GCSE. Through the subject they will continue to develop an understanding of mathematical processes.

* Pure Maths – topics include Differentiation and Integration, Vectors
* Mechanics – topics include forces, friction, moments.
* Statistics – topics include Hypothesis testing, statistical techniques.

The course is studied over two years and allows for a build-up of skills. Topics include differentiation and integration, hypothesis testing, forces and friction amongst many others. The skills learned in A level maths support students in a range of subjects to study at degree level. The exam board is Edexcel.